WHAT IS CLAIMED IS

1. An optical time-division multiplex signal processing apparatus, comprising:

an optical dispersion part supplied with an optical time-division multiplex signal and an optical clock signal, said optical dispersion part providing optical dispersion to said optical time-division multiplex signal and said optical clock signal;

an optical detector coupled optically to said optical dispersion part, said optical detector detecting said optical time-division multiplex signal and said clock signal from said optical dispersion part in a superposed state; and

a filter connected to an output terminal of said optical detector, said filter filtering out an electric signal of a desired frequency band from an output electric signal of said optical detector.

2. An optical time-division multiplex signal processing apparatus as claimed in claim 1, wherein said optical dispersion part comprises an optical coupler having a first input end to which said optical time-division multiplexed optical signal is supplied and a second input end to which an optical clock signal is supplied, said optical coupler optically coupling said optical time-division multiplex signal with said optical clock signal therein, and a dispersion medium coupled optically to an output end of said optical coupler, said dispersion medium causing an optical dispersion in said optical time-

division multiplex signal and said optical clock signal.

3. An optical time-division multiplex signal processing apparatus as claimed in claim 2, wherein said dispersion medium is selected from any of a single-mode optical fiber, a diffraction grating and a prism.

4. An optical time-division multiplex signal processing apparatus as claimed in claim 2, wherein said optical coupler includes a depolarization element at said second input end.

5. An optical time-division multiplex signal processing apparatus as claimed in claim 2, wherein said optical dispersion part comprises a first dispersion medium supplied with said optical time-division multiplex signal, a second dispersion medium supplied with said optical clock signal, and an optical coupler coupling said optical time-division multiplex signal passed through said first dispersion medium and said optical clock signal passed through said second dispersion medium.

6. A processing method of an optical time-division multiplex signal, comprising the steps of:

providing a chirp to each of an optical time-division multiplex signal and an optical clock signal; and

detecting a beat component formed between said optical time-division multiplex signal and said optical signal provided with respective chirp.

7. An optical time-division multiplex signal receiver, comprising:

an optical dispersion part supplied with an optical time-division multiplex signal and an optical clock signal, said optical dispersion part providing a chirp to each of said optical time-division multiplex signal and said optical clock signal;

an optical detector coupled optically to said optical dispersion part, said optical detector receiving said optical time-division multiplex signal and said optical clock signal in a superposed state;

a filter connected to an output terminal of said optical detector, said filter filtering out an electric signal of a desired frequency band from an output electric signal of said optical detector; and

an envelop detector supplied with an output signal of said filter.

8. An optical time-division multiplex receiver, comprising:

a first optical dispersion part supplied with an optical time-division multiplex signal and

causing an optical dispersion therein;

a second optical dispersion part supplied with an optical clock signal and causing an optical dispersion therein;

a plurality of optical detectors each coupled optically to said first and second optical dispersion parts, each of said optical detectors receiving said optical time-division multiplex signal and said optical clock signal in a superposed state;

a plurality of band-pass filters each provided in correspondence to one of said plurality of optical detectors, each of said band-pass filters filtering out an output signal of said optical detector corresponding thereto; and

a plurality of envelop detectors each provided in correspondence to one of said plurality of band-pass filters,

wherein said plurality of band-pass filters have mutually different band-pass characteristics.

9. An optical-time division multiplex signal receiver as claimed in claim 8, wherein each of said plurality of band-pass filters has a pass-band tuned to a frequency of a beat component formed between an optical signal component included in said time-division multiplex optical signal and said optical clock signal.

10. An optical time-division multiplex receiver, comprising:

a first optical dispersion part supplied

with an optical time-division multiplex signal and providing an optical dispersion thereto;

a second optical dispersion part supplied with an optical clock signal and providing an optical dispersion thereto;

a plurality of optical delay elements each coupled to said second optical dispersion part, each of said plurality of optical delay elements inducing a delay in an optical clock signal supplied thereto from said second optical dispersion part;

a plurality of optical detectors each coupled optically to said first optical dispersion part and further to one of said plurality of optical delay elements, each of said optical detectors detecting said optical time-division multiplex signal from said first dispersion part and said optical clock signal from said optical delay element;

a plurality of band-pass filters each supplied with an output signal of one of said plurality of optical detectors corresponding thereto; and

a plurality of envelop detectors each supplied with an output signal of one of said plurality of band-pass filters corresponding thereto.

11. An optical time-division multiplex signal receiver as claimed in claim 10, wherein said band-pass filters have a substantially identical pass-band.

12. An optical time-division multiplex

signal receiver as claimed in claim 11, wherein said plurality of optical delay elements are provided in correspondence to a plurality of channels in said optical time-division multiplex signal, and wherein each of said optical delay elements has a delay time set so as to form a beat signal between an optical signal of a corresponding channel and said clock signal with a frequency corresponding to said pass-band.